

CLAIMS

1. A device for dithering a three-color source image, comprising:
 - a first logic for dissecting a color space of said source image into a plurality of tetrahedrons each having four vertices;
 - a second logic for locating one of said tetrahedrons that contains a point corresponding to a value of a pixel of said source image;
 - a third logic for generating a random number as a threshold value for dithering said pixel of said source image;
 - a fourth logic for assigning a probability density corresponding to each of said vertex of said located tetrahedron;
 - a fifth logic selecting a vertex as an interim output provided by said threshold value through an inverse probability distribution function derived from said probability densities of said vertices; and
 - a sixth logic for locating an output point in an output color space corresponding to said selected vertex.
2. A device for dithering a source image according to claim 1, wherein said first logic that dissects said color space further comprises:
 - a first logic for truncating said value of said image pixel of said source image, for locating a 3-dimensional cubic subinterval containing said point; and
 - a second logic for further dissecting said 3-dimensional cubic subinterval into a plurality of tetrahedrons.
3. A device for dithering a source image according to claim 1, wherein said logic for generating a random number is a 2-dimensional array of pseudo-random numbers overlaying on top of said source image.

1 15. A device for dithering a source image as recited in claim 13, further comprising a fifth
2 logic containing look-up tables for converting an input colorant value into said pixel value.

1 16. A device for dithering a source image as recited in claim 13, wherein the device is
2 embedded in a central processing unit in a computer system.

1 17. A device for dithering a source image as recited in claim 13, wherein said device is
2 embedded in a processor in an output device.

1 18. A device for dithering a source image as recited in claim 17, wherein said output device
2 is a printer.

1 19. A device for dithering a source image as recited in claim 17, wherein said output device
2 is a display monitor.

1 20. A method for dithering a source color image via weighting coefficients associated with a
2 plurality of sample points in a source color space of said source color image, comprising the
3 steps of:

4 generating said weighting coefficients of said sample points, wherein said weighting
5 coefficients are probability densities of said sample points;

6 generating a random number as a threshold value for dithering a pixel value of said
7 source image;

8 selecting a point from said plurality of said sample points provided by said threshold
9 value through an inverse probability distribution function derived from said weighting
10 coefficients of said points; and

11 locating an output point in an output color space corresponding to said selected point.

1 21. A method for dithering a source image according to claim 20, wherein the step of
2 generating a random number includes the step of fetching a pseudo-random number from a 2-
3 dimensional threshold array overlaying on top of said source image.